Minimum Requirements of the
MI BPM Transitionboard Control Module

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February 17, 2006

Abstract

This document briefly specifies some minimum requirements of the MI BPM Transitionboard Control Module for the MI BPM Upgrade project.
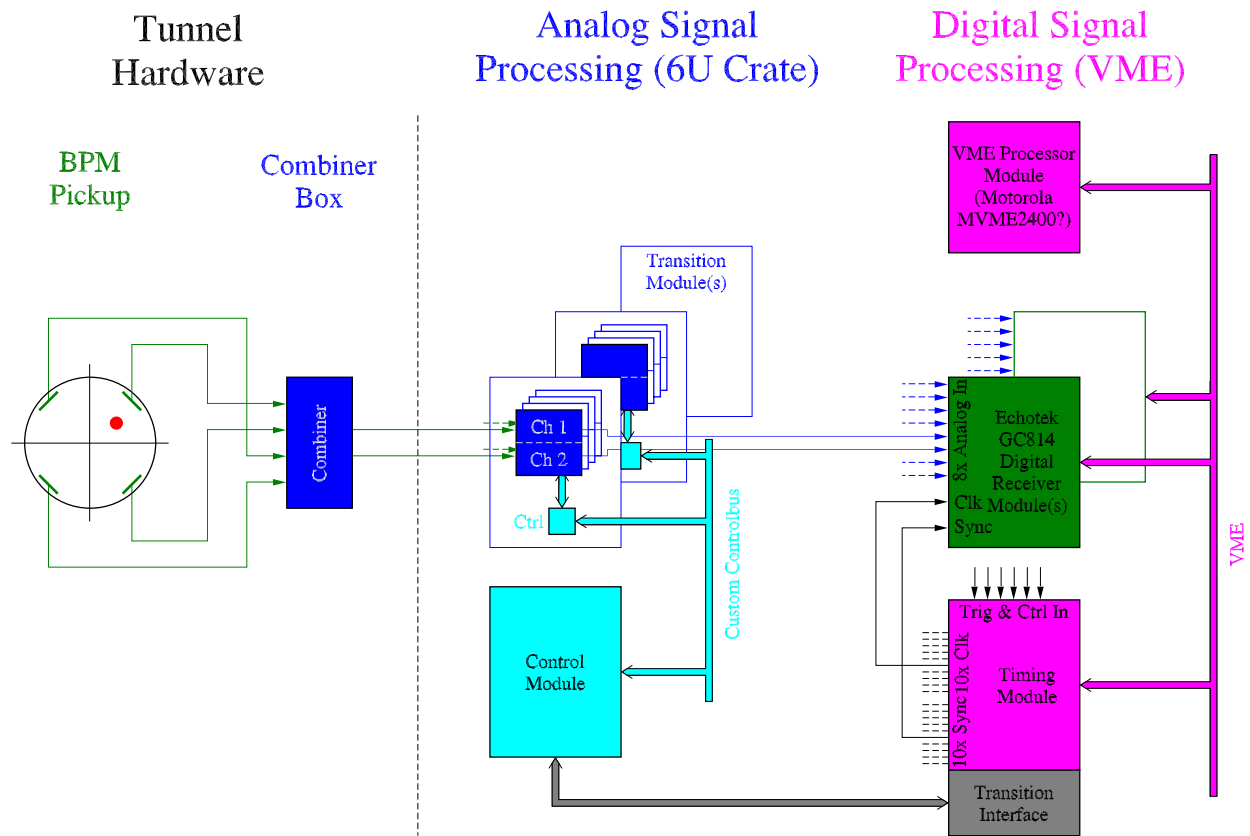
Introduction

Figure 1: Overview of the MI BPM hardware.

Fig. 1 gives an overview of the MI BPM hardware. The *Transitionboard* (or *Transitionmodule*) interfaces the MI BPM pickup signals to the *Echotek* digitizer (digital receiver) module. Each Transitionboard has 8
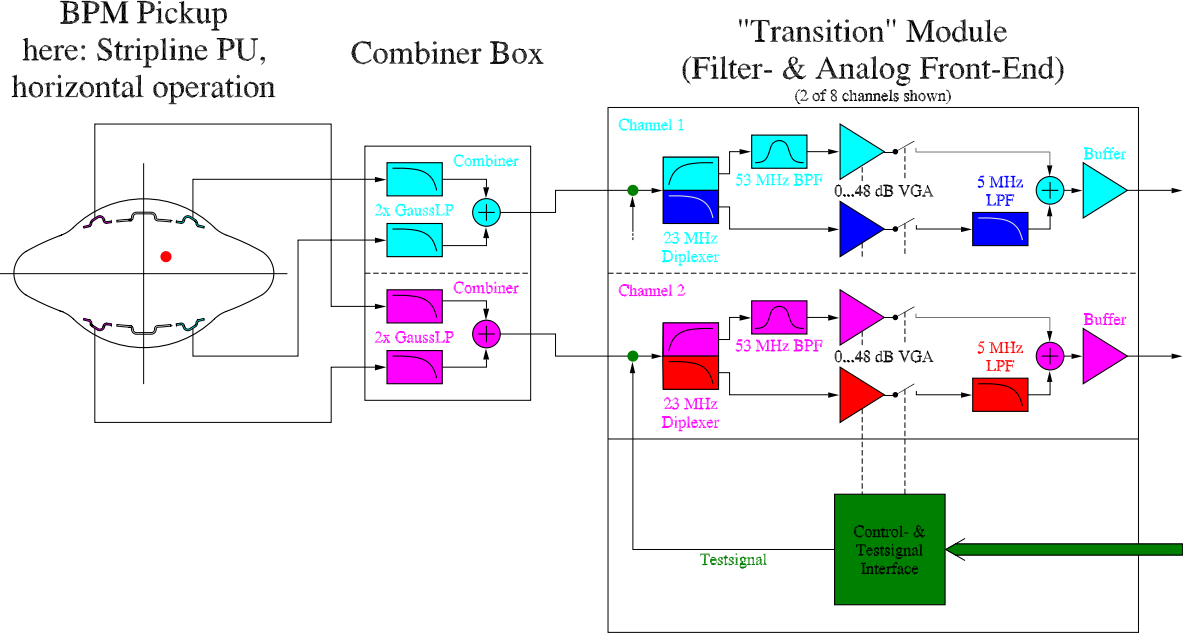
Figure 2: MI BPM analog hardware.

channels, each channel consists out of a 2.5 MHz and a 53 MHz amplifier gain stage. These amplifiers can be enabled/disabled remotely, also can their gain be varied. The Transitionboard also allows the remote controlled supply of 2.5 MHz or 53 MHz test signals (see Fig. 2). The CPLG in each Transitionboard handles the on board control. A DIP switch con be used for optional settings or individual addressing. Up to 10 Transitionboards are located in a 6U high frame, power by a separate linear power supply. The control of the Transitionboards is handed through a *Control Module* from a here called *Transition Interface*, which extends the *Timing Module*. The Control Module can work basically in 2 operation modes:

Remote All commands from the Timing Module (Transition Interface) are passed through to the Transitionboards. The Control Module is passive.

Local The Transition Crate works independent from external control. All commands to the Transitionboards are generated locally, either in the Control Module (frontpanel) or through an attached computer interface (USB).

A display on the frontpanel of the Control Module shows the current state of the system in both modes.

Minimum Requirements for the Control Module

The Control Module should have:

- A frontpanel local/remote toggle switch.

- A preferable USB interface at the frontpanel, for optional local control with a notebook computer.

- A display which shows the current status of the system, i. e. selected frequency and gain, HILO status, test signal status (A/B, on/off). Other, more detailed information may be displayed optional.

The following local control functions have to be controlled on the Transitionboard, from the frontpanel of the Control Module:

- Enable/disable amplifier gain stages (ENB25, ENB53), in this way the frequency is selected.

- Gain control of the selected amplifier (0...48 dB).

- Enable/disable postamplifier gain (+12 dB) of the selected gain stage (HILO).

- Enable/disable local testsignals with the corresponding frequency to the selected gain stages. The (post)amplifier gains have to be set accordingly. Test signals A and B have to be switched separately.

Under default steady state remote operation no clock signals are allowed on the Transitionboards! During boot up, change of state (remote or local) and local control clock signals may be present on the Transitionboard. All control settings are in common for all Transitionboards in a crate, except:
The gain control of the 53 MHz stages requires an individual control of each Transitionboard (or group of channels) in order to compensate the cable attenuation differences. Therefore two solutions are possible:

- The compensation is done locally on each Transitionboard using the DIP switch. All Transitionboards are controlled in common.

- The DIP switch is used to address each individual Transitionboard. The 53 MHz gain control is done individual for each Transitionboard.